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[—/US]; 2131 Glencoe Hills Drive, Apartment 10, Ann Arbor, MI 48109 (US). **HOLLISTER, Scott, J.** [US/US]; 2015 Churchill Drive, Ann Arbor, MI 48103 (US). **LIN, Cheng-Yu** [—/US]; 3060 Whisperwood Drive, Apartment 406, Ann Arbor, MI 48105 (US).

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(74) Agents: **WADE, Bryant, E.** et al.; Harness, Dickey & Pierce, P.L.C., P.O. Box 828, Bloomfield Hills, MI 48303 (US).

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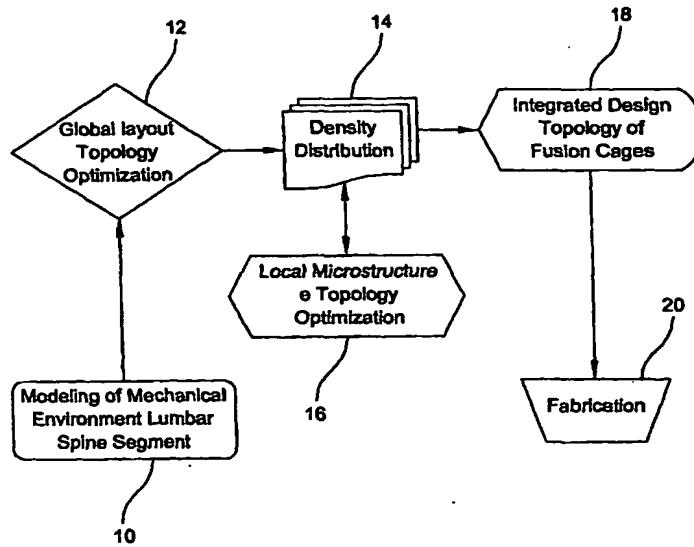
(71) Applicant (for all designated States except US): **THE REGENTS OF THE UNIVERSITY OF MICHIGAN ET AL.** [US/US]; Technology Management Office, Wolverine Tower, Room 2071, 3003 S. State Street, Ann Arbor, MI 48109-1280 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LIN, Chia, Ying**

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(54) Title: INTEGRATED GLOBAL LAYOUT AND LOCAL MICROSTRUCTURE TOPOLOGY OPTIMIZATION APPROACH FOR SPINAL CAGE DESIGN AND FABRICATION



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(57) Abstract: A method being in block (10) where a mechanical environment of a lumbar spine segments is modeled. In block (12) the method performs a global layout topology optimization process. Then in Block (14), the method performs density distribution on the global layout topology optimization solution from block (12). The density distribution contemplates a local microstructure topology optimization solution from block (16). After completion of the density distribution process in block (14), the methods proceeds to block (18). In block 18, the methods provides an integrated design topology solution for the fusion cage. In the block (20), the as-designed cage fabricated.



Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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## A. CLASSIFICATION OF SUBJECT MATTER

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 US CL : 700/118; 606/85; 623/17.11

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 U.S. : 700/118; 606/85; 623/17.11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,425,920 B1 (Hamada) 30 July 2002, (30.07.2002), Whole Document.	1-20
A	US 6,443,989 B1 (Jackson) 03 September 2002 (03.09.2002), Whole Document.	1-20
A	US 6,471,724 B2 (ZBEDLICK et al.) 29 OCTOBER 2002 (29.10.2002), Whole Document.	1-20

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 Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450

Faxsimile No. (703)305-3230

Authorized officer

Leo Picard

Telephone No. (703) 308-0000

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Continuation of Item 4 of the first sheet:  
More than seven words.

MICROSTRUCTURE TOPOLOGY OPTIMIZATION APPROACH FOR CAGE DESIGN